

ASCO 7000 SERIES Power Transfer Switches



ASCO®


EMERSON
Network Power



Critical Loads Demand ASCO

ASCO 7000 SERIES Power Transfer Switches

Protecting:

- Healthcare Facilities
- Web Hosting, Internet Data Centers
- Commercial Buildings / Industrial Buildings
- Telecom Central Offices
- Process Manufacturing / Wafer Fabrication Plants /
- Distributed Power / Load Management

As we become more dependent on the quality and reliability of electrical power, interruption or complete loss of power can create serious and even crippling financial losses, or impose dangers to life and safety.

ASCO Power Technologies (ASCO) provides the solutions to handle the transfer of critical loads to emergency sources reliably and with state of the art products. Using ASCO products can mean the difference between a minor inconvenience and a major catastrophe. You'll find ASCO Power Transfer Switches wherever there is a critical load to be protected.

When flexibility in power switching is a must, ASCO offers a variety of product solutions to meet virtually every application requirement, including distributed generation applications. That's why the 7000 SERIES is available in open, delayed, closed and closed soft load configurations. Additionally, switched or overlapping neutral options provide for reliable operation of ground fault protection systems and reduction of voltage transients from unbalanced load switching.

ASCO Power Transfer Switches are the first CE Marked, IEC 60947-6-1 compliant Transfer Switches in the world.



The Recognized Leader in Power Transfer Switch Technology Offers the Most Advanced Transfer Switches in the World.

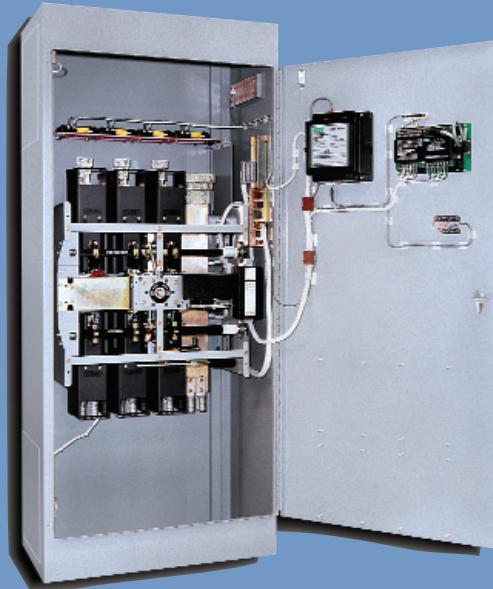
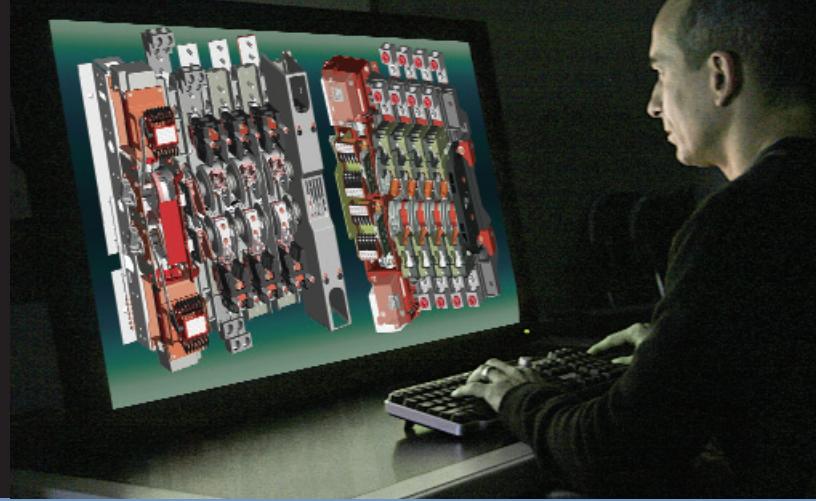


Fig. 1: Three Pole 7000 SERIES Automatic Transfer Switch rated 1600 Amperes (shown with optional front connected terminals and Power Manager).



7000 SERIES

ASCO Power Transfer Switches are the standard of the industry. High speed transfer of loads between alternate sources of power, regardless of ampacity size, is achieved by a reliable, field proven solenoid operating mechanism. When combined with a programmable microprocessor controller with keypad and LCD display, they offer the most advanced method of transferring all types of loads, such as motors, electronic drives, UPS's and microprocessor based systems. 7000 SERIES Power Transfer Switches are available open or enclosed, in ampacity sizes from 30 through 4000 Amperes with the largest selection of optional accessories offered anywhere. All switching configurations are available with an integrally mounted bypass-isolation switch and/or rated for use in service entrance applications.

7000 SERIES Power Transfer Switches Product Features

- Conventional two-position transfer configuration, plus closed and delayed transition modes of operation. All configurations available with either automatic or non-automatic control.
- UL listed to 1008 Transfer Switch Equipment & CSA certified to CSA 22.2 No.178-1978 Automatic Transfer Switches.
- Qualified and certified to IEC 60947-6-1, CE marked (optional). (Limited to certain accessories.)
- Rated up to 600 VAC, 30 through 4000 Amperes.
- Reliable and field proven solenoid operating mechanism.
- High withstand and close-on ratings including short time withstand current rating for optimum flexibility in circuit breaker coordination (600-4000 Amperes).
- Solid, switched, or overlapping neutral conductor options.
- Front replaceable main and arcing contacts (800-4000 Amperes).
- Programmable microprocessor controller with keypad and LCD display.
- Centrally located terminal block for customer control connections (260-4000 Amperes).
- 16mm, industrial grade control switches and indicating lights.
- Switch position LED indicators and source acceptability lights.
- Standard ground conductor connections.
- Four auxiliary contacts, two contacts closed when switch is in normal position and two contacts closed when switch is in emergency position.
- Local/remote communications capability for interfacing with ASCO POWERQUEST® communication products.



Fig. 2: Four pole, Closed Transition Transfer Switch rated 1000 Amperes in Type 1 enclosure.

Closed Transition Transfer Switching

ASCO Automatic Closed Transition Transfer Switches feature main contacts that overlap, permitting the transfer of electrical loads without power interruption. The switch transfers in a make-before-break mode if both sources are within acceptable parameters. Control logic continuously monitors source conditions and automatically determines whether the load transfer should be open (conventional non-overlap mode) or closed transition. Available 150 through 4000 Amperes.

Closed Transition Transfer within 5 electrical degrees is achieved passively, without control of engine generator set. Therefore, no additional control wire runs are required between the ATS and engine generator set governor. Plus, protective relaying may not be required under normal operation since the contact overlap time is less than 100 milliseconds (consult your local utility on protective relay requirements).

Failure to synchronize indication and extended parallel time protection is built-in to all 7000 SERIES closed transition controls to prevent abnormal operation.

Delayed Transition Transfer Switching

ASCO Delayed Transition Transfer Switches are designed to provide transfer of loads between power sources with a timed load disconnect position for an adjustable period of time. Applications include older style variable frequency drives, rectifier banks, and load management applications.

- Available in 150 through 4000 Amperes.
- Utilizes reliable, field proven solenoid operating mechanisms.
- Mechanical interlocks to prevent direct connection of both sources.
- Indicator light (16mm, industrial grade type LED) for load disconnect position.
- Adjustable time delay for load disconnect position.



Fig. 3: Four pole, Delayed Transition Transfer Switch rated 2000 Amperes.

ASCO® 7000 SERIES Power Switching Solutions

Non-Automatic Transfer Switching

ASCO Non-Automatic Transfer Switches are electrically operated units which are operated with manual control switches mounted locally or at remote locations.

- Sizes from 30 through 4000 Amperes.
- Microprocessor based controller provides for addition of optional accessories.
- Controller prevents inadvertent operation under low voltage conditions.
- Low control circuit operating currents allow for long line runs between remotely mounted manual control switches and the transfer switch.
- Source acceptability lights inform operator if sources are available to accept load.
- Standard inphase monitor can be activated for transferring motor loads.



Fig. 4: Three pole Non-Automatic, electrically operated 400 ampere switch shown in Type 1 enclosure.

Withstand and Close-On Ratings for all 7000 SERIES Products

| Switch Rating (Amps) | | UL 1008 Withstand and Close-On Ratings ¹ | | | | | | | | | |
|----------------------|------------------------------|---|---------------|----------------------------|---------------|------------------------------|---------------|-------------------|-------|--|-------------------|
| | | Ratings (RMS Symmetrical) | | | | | | Recommended Fuses | | Short Time Ratings @ 480V ⁴ | |
| Transfer Switches | Bypass Switches | "Specific" Breaker ² | Volts Maximum | "Any" Breaker ³ | Volts Maximum | Current-Limiting Fuse Rating | Volts Maximum | Max Size, A | Class | Rating (RMS Sym),A | Duration (Cycles) |
| 30 | - | | | 10kA | 600V | 100kA | 480V | 60 | J | N/A | - |
| 70, 100, 125, 150 | - | 22kA | 480V | 10kA | 600V | 200kA | 480V | 200 | J | N/A | - |
| 200 | - | 22kA | 480V | 10kA | 480V | 200kA | 480V | 200 | J | N/A | - |
| 230 | - | 22kA | 480V | 10kA | 480V | 100kA | 480V | 300 | J | N/A | - |
| 260, 400, 600 | 150, 200, 230, 260, 400, 600 | 50kA | 480V | 65kA | 240V | 200kA | 600V | 600 | J | N/A | - |
| | | | | 42kA ⁶ | 480V | | | | | | |
| | | 42kA | | 35kA | 600V | | | 800 | L | | |
| 800 - 1200 | 800 - 1200 | 65kA | 600V | 50kA | 600V | 200kA | 600V | 1600 | L | 36kA | 18 |
| 1600, 2000 | 1600, 2000 | 125kA ⁷ | 480V | 100kA ⁵ | 600V | 200kA | 600V | 3000 | L | 42kA | 18 |
| 2600, 3000 | 3000 | - | 600V | 100kA | 600V | 200kA | 600V | 4000 | L | 42kA | 18 |
| 4000 | 4000 | - | 600V | 100kA | 600V | 200kA | 600V | 5000 | L | 85kA | 8 |
| | | | | | | | | | | 65kA | 30 |

1) All WCR values indicated are tested in accordance with the requirements of UL 1008. See ASCO Pub. 1128 for more WCR information.

2) Application requirements may permit higher WCR for certain sizes of switch. Contact ASCO for guidance if application requires higher WCR.

3) Based on 3 cycles for 260-4000A and 1.5 cycles for 30-230A switches. Applicable to circuit breakers with instantaneous trip elements.

4) Short Time ratings are provided for applications involving circuit breakers that utilize trip delay settings for system selective coordination.

5) Optional front connected service (Accy 40MY and 40NY) limits 1600 and 2000A G Frame switches to 85kA Any Breaker rating.

6) J Frame switches utilizing overlapping neutral (code "C") are limited to 35kA Any Breaker rating at 480V.

7) 7000 Series Bypass Switches ONLY

Automatic Transfer Bypass-Isolation Switches



Fig. 5: Rated
150-600 Amps



Fig. 6: Rated
600- 1200 Amps



Fig. 7: Rated
800-3000 Amps



Fig. 8: Rated
4000 Amps

ASCO Automatic Transfer & Bypass-Isolation Switches are available in open transition, closed transition and delayed transition designs. The bypass and isolation features allow the primary automatic transfer switch to be inspected, tested, and maintained without any interruption of power to the load. They also provide redundant power transfer in the event the ATS is disabled or removed from service.

- Available 150 to 4000 Amperes.
- Allows bypass-isolation without load interruption.
- Bypass switch and transfer switch have identical electrical ratings.
- Heavy duty mechanical interlocks prevent undesirable operation.
- Bypass contacts carry current only during bypass mode.

- Transfer switch is drawout design for ease of maintenance.
- Bypass and isolation handles are permanently mounted. The bypass switch has dead front quick-make, quick-break operation for transferring of loads between live sources.
- Bypass switch is fully rated for use as a manual 3-position transfer switch.
- Bypass and isolation functions are simple, requiring a total of two operating handles.
- No toggle switches, push buttons, selector switches or levers are required for bypass-isolation operation.
- Mechanical indicators show bypass and transfer switch positions.
- 800 -1200 ampere available in shallow depth, front connected or rear connected designs.

Transfer Switch Drawout Features (150-4000 Amperes)

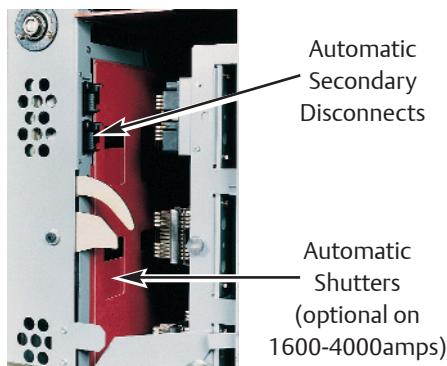


Fig. 9: Bypass-Isolation Transfer Switch secondary disconnects and optional automatic shutters.

- Automatic secondary disconnects remove all control power as switch is withdrawn.
- Drawout carriage provides for easy transfer switch maintenance and/or removal via commercially available breaker hoists.
- Optional transfer switch lifting yoke kit available
- Optional automatic shutters which close when the transfer switch is withdrawn to provide bus isolation, specify accessory 82C.(1600-4000A only)

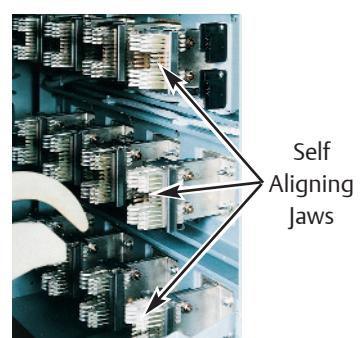


Fig. 10: Bypass-Isolation Transfer Switch self aligning power jaws.

ASCO® 7000 SERIES Power Switching Solutions

Bypass and Isolation Handles - Simple as 1, 2, 3

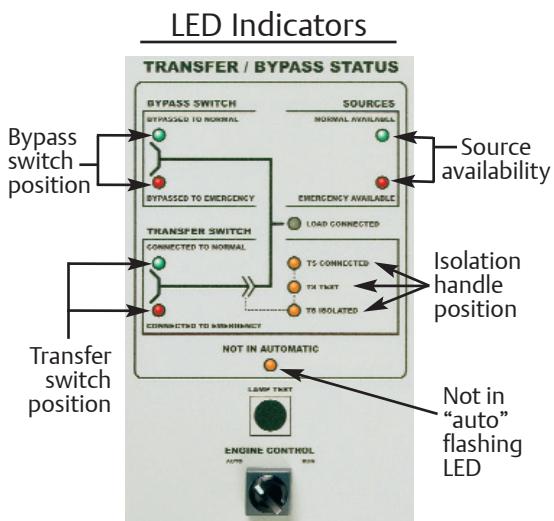
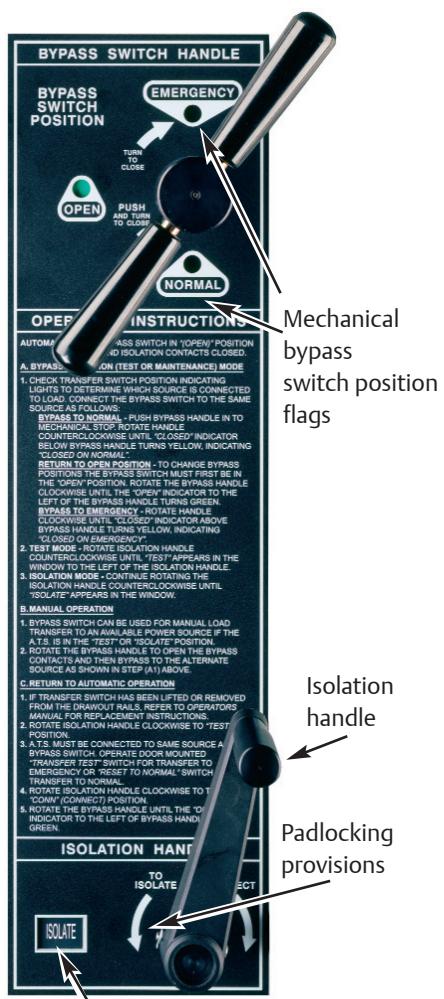


Fig. 11: Transfer Bypass Status Panel*

*Standard on switches up through H 1200A.
Specify ACC 82E for G frame 1600-4000A



Mechanical isolation handle position window (connected/test/isolate)

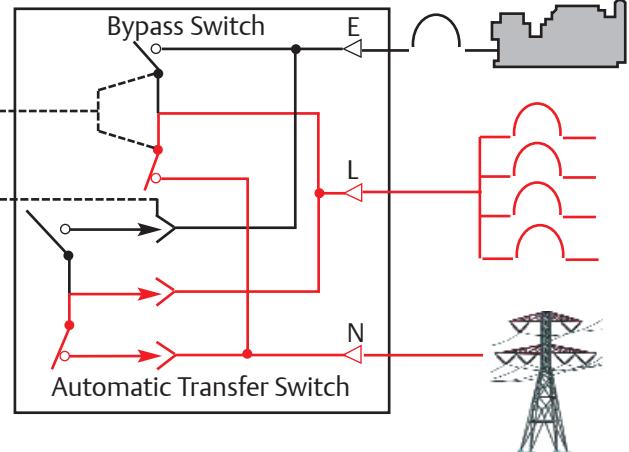
Fig. 12: Bypass-Isolation Switch user interface

1 Bypass to Normal

Push in bypass handle and turn it counter clockwise

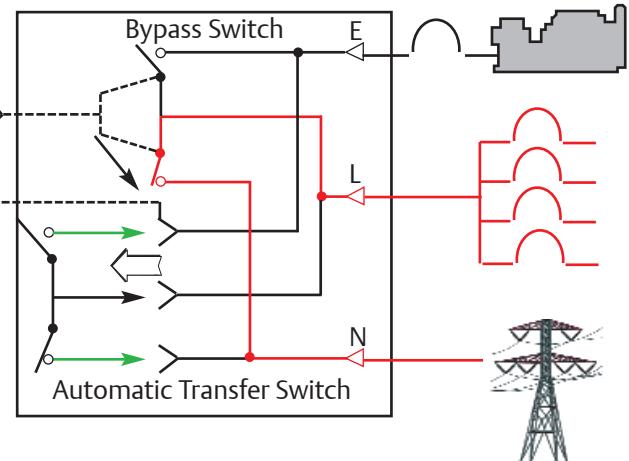
Bypass Handle

Isolation Handle



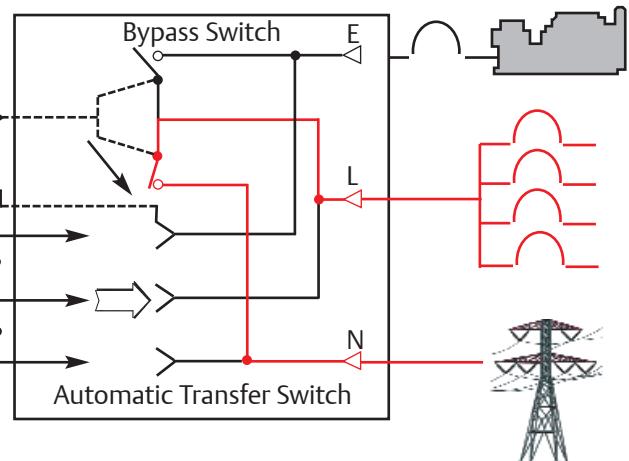
2 Test Position

Turn isolation handle counter clockwise until window shows "Test"



3 Isolation Position

Turn isolation handle counter clockwise until window shows "Isolate"



Key:

— Represents Current Flow

— In test position control panel remains energized to allow for electrical operation of a transfer switch.

ASCO® 7000 SERIES Service Entrance Power Transfer Switches

The ASCO Service Entrance Power Transfer Switch combines automatic power switching with a disconnect and overcurrent protective device on the utility source. The power transfer switch meets all National Electric Code requirements for installation at a facility's main utility service entrance. Service entrance rated transfer switches generally are installed at facilities that have a single utility feed and a single emergency power source. A circuit breaker serves as the utility disconnect and links are provided to disconnect both neutral and ground connections.

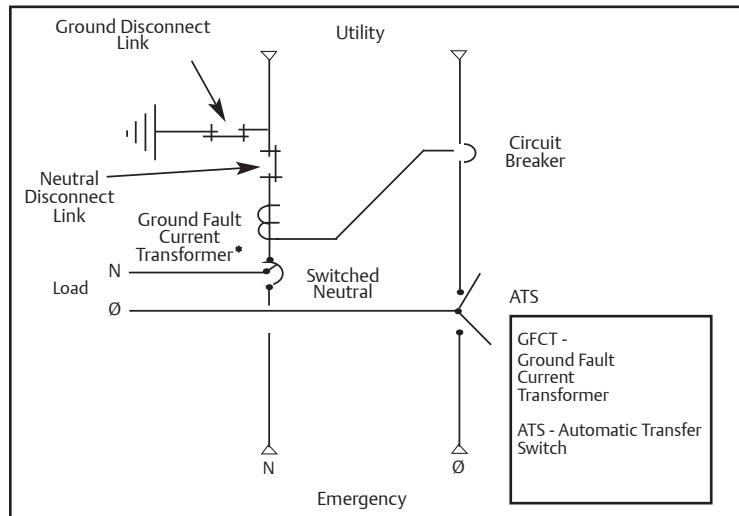
This product is either UL 1008 or UL 891 listed and is available up to 600V and 4000A in Standard, Delayed, Closed Transition, Soft Load, and Bypass Isolation Configurations.



Fig. 13: Ground and neutral disconnect links

Standard Features

- Available from 150 to 4000 Amperes
- ASCO 7000 SERIES Power Transfer Switch is UL 1008 Listed
- Standard UL Type 1 Enclosure
- Disconnect and overcurrent protective device on the utility source: molded case circuit breaker 150 to 2000 Amp; insulated case 3000 to 4000 Amp
- Disconnect link on Neutral
- Disconnect link on Ground
- Ground and Neutral Bus, all silver-plated copper
- Solderless screw type terminals for External Power Connections
- Meets all NEC requirements for use as service entrance
- Internet enabled monitoring and control
- Service entrance breakers rated 100% for 1000 Amps and above; 80% below 1000Amps



One line diagram of a typical service entrance rated transfer switch available in Solid, Switched or Overlapping Neutral

* Ground fault trip protection provided on sizes of 1000 Amperes and above

Optional Features

- | | |
|--|---|
| <ul style="list-style-type: none"> • Enclosures - Secure Double Door <ul style="list-style-type: none"> - UL Type 3R w/strip heater & thermostat - UL Type 4 or 4X - UL Type 12 • Connections <ul style="list-style-type: none"> - Crimp lugs - Bus Riser on Normal, Emergency or Load • Protective Relays/Metering <ul style="list-style-type: none"> - Accessory 85L , see page 15 | <ul style="list-style-type: none"> • Surge Suppression <ul style="list-style-type: none"> - Accessory 73, Surge protector (see pg. 14) • Communications <ul style="list-style-type: none"> - ASCO 72E Ethernet Connectivity module - ASCO POWERQUEST® 32.15E, see page 18 - ASCO 5500 SERIES Thin Web Server for internet connection , see page 20 • Additional Breaker(s) <ul style="list-style-type: none"> - Circuit Breaker on Emergency - Load Distribution Panel • Optional high AIC ratings on breakers |
|--|---|

Consult ASCO for additional features

ASCO® 7000 SERIES Service Entrance Power Transfer Switches

Ordering Information

To order an ASCO 7000 SERIES Service Entrance Power Transfer Switch, complete the following catalog number.

7 A US + A 3 + 400 + N + 5X + C

| | Product | | Neutral Code* | Phase Poles | Amperes | Voltage Code | Grp Code | Enclosure |
|--------------------------------|---------|---------------------------|----------------------------|-------------|-------------------------|--------------|------------------------------|---------------------------------------|
| A Automatic N Non-Automatic | US | Conventional 2-Position | A Solid Neutral (standard) | 2 3 | 70, 100 | C 208 | 5 5X-optional accessories | C Type 1 enclosure |
| | UB | Open Transition Bypass | B Switched Neutral | | 150, 200 | D 220 | | M Type 3R secure double door |
| | CUS | Closed Transition | C Overlapping Neutral | | 225, 250 | E 230 | | N Type 4 secure double door |
| | CUB | Closed Transition Bypass | | | 400, 600 | F 240 | | P Type 4X secure double door (31b SS) |
| | DUS | Delayed Transition | | | 800, 1000 | G 380 | | |
| | DUB | Delayed Transition Bypass | | | 1200, 1600, 2000, 2500, | H 400 | | Q Type 12 secure double door |
| | | | | | 3000 | K 415 | | |
| | | | | | 4000 | L 440 | | |
| | | | | | | M 460 | | |
| | | | | | | N 480 | | |
| | | | | | | P 550 | | |
| | | | | | | Q 575 | | |
| | | | | | | R 600 | | |

*Note. Switches rated 150, 600-3000 amps available with 2, 3 or either conventional switched neutral (4 poles) or overlapping neutral (optional). For 4 pole applications on switches rates 150 to 400 amps (bypass switches only) and 4000 amps specify overlapping switched neutral (optional). Conventional switched neutral is provided on delayed transition transfer products when specified.

The Example Catalog Number above is 7AUSA3400N5XC (X is used to specify optional accessories).

Dimensions and Weights for non-bypass configurations

Type 1 and 3R Enclosures⁴

| Switch Rating amps | Phase Poles | Neutral Code | Type 1 Dimensions, In. (mm) | | | Approx. Shipping Weight Lb. (kg) |
|---------------------------------------|-------------|--------------|-----------------------------|-------------|-------------|----------------------------------|
| | | | Width | Height | Depth | |
| 70, 100, 150, 200, 225 | 2 | STD | 36.5 (927) | 48.5 (1232) | 13.25 (337) | 400 (185) |
| | 2 | B, C | 36.5 (927) | 48.5 (1232) | 13.25 (337) | 408 (188) |
| | 3 | STD | 36.5 (927) | 48.5 (1232) | 13.25 (337) | 408 (188) |
| | 3 | B, C | 36.5 (927) | 48.5 (1232) | 13.25 (337) | 416 (192) |
| 250, 400 | 2 | STD | 36.5 (927) | 48.5 (1232) | 13.25 (337) | 400 (185) |
| | 2 | C | 36.5 (927) | 48.5 (1232) | 13.25 (337) | 408 (188) |
| | 3 | STD | 36.5 (927) | 48.5 (1232) | 13.25 (337) | 408 (188) |
| | 3 | C | 36.5 (927) | 48.5 (1232) | 13.25 (337) | 416 (192) |
| 600 ¹ , 800 ¹ | 2 | STD | 38 (965) | 91 (2311) | 28 (711) | 800 (370) |
| | 2 | B, C | 38 (965) | 91 (2311) | 28 (711) | 820 (378) |
| | 3 | STD | 38 (965) | 91 (2311) | 28 (711) | 820 (378) |
| | 3 | B, C | 38 (965) | 91 (2311) | 28 (711) | 846 (390) |
| 1000 ¹ , 1200 ¹ | 2 | STD | 38 (965) | 91 (2311) | 48 (1218) | 1085 (501) |
| | 2 | B, C | 38 (965) | 91 (2311) | 48 (1218) | 1105 (510) |
| | 3 | STD | 38 (965) | 91 (2311) | 48 (1218) | 1105 (510) |
| | 3 | B, C | 38 (965) | 91 (2311) | 48 (1218) | 1134 (523) |
| 1600 ¹ , 2000 ¹ | 3 | STD | 38 (965) | 91 (2311) | 48 (1218) | 2590 (1198) |
| | 3 | B, C | 38 (965) | 91 (2311) | 48 (1218) | 2640 (1218) |
| 2500 ¹ , 3000 ¹ | 3 | STD | 38 (965) | 91 (2311) | 72 (1829) | 4590 (2118) |
| | 3 | B, C | 38 (965) | 91 (2311) | 72 (1829) | 4655 (2148) |

| Switch Rating amps | Phase Poles | Neutral Code | Type 3R Dimensions, In. (mm) | | | Approx. Shipping Weight Lb. (kg) |
|---------------------------------------|-------------|--------------|------------------------------|------------|----------|----------------------------------|
| | | | Width | Height | Depth | |
| 70, 100, 150, 200, 225 | 2 | STD | 36(914) | 48(1219) | 16 (406) | 520 (236) |
| | 2 | B, C | 36(914) | 48(1219) | 16 (406) | 530 (240) |
| | 3 | STD | 36(914) | 48(1219) | 16 (406) | 530 (240) |
| | 3 | B, C | 36(914) | 48(1219) | 16 (406) | 548 (249) |
| 250, 400 | 2 | STD | 36(914) | 48(1219) | 16 (406) | 520 (236) |
| | 2 | C | 36(914) | 48(1219) | 16 (406) | 530 (240) |
| | 3 | STD | 36(914) | 48(1219) | 16 (406) | 530 (240) |
| | 3 | C | 36(914) | 48(1219) | 16 (406) | 548 (249) |
| 600 ¹ , 800 ¹ | 2 | STD | 41(1041) | 95.5(2426) | 34(864) | 990 (458) |
| | 2 | B, C | 41(1041) | 95.5(2426) | 34(864) | 1010 (467) |
| | 3 | STD | 41(1041) | 95.5(2426) | 34(864) | 1010 (467) |
| | 3 | B, C | 41(1041) | 95.5(2426) | 34(864) | 1036 (479) |
| 1000 ¹ , 1200 ¹ | 2 | STD | 41(1041) | 95.5(2426) | 62(1575) | 1305 (604) |
| | 2 | B, C | 41(1041) | 95.5(2426) | 62(1575) | 1325 (613) |
| | 3 | STD | 41(1041) | 95.5(2426) | 62(1575) | 1325 (613) |
| | 3 | B, C | 41(1041) | 95.5(2426) | 62(1575) | 1354 (626) |
| 1600 ¹ , 2000 ¹ | 3 | STD | 41(1041) | 95.5(2426) | 62(1575) | 2890 (1337) |
| | 3 | B, C | 41(1041) | 95.5(2426) | 62(1575) | 2940 (1360) |
| 2500 ¹ , 3000 ¹ | 3 | STD | 41(1041) | 96(2438) | 85(2159) | 5350 (2474) |
| | 3 | B, C | 41(1041) | 96(2438) | 85(2159) | 5415 (2504) |

Ampere Interrupting Capacity (AIC) Ratings

| Switch Rating amps | AIC Rating (kA) | |
|--------------------|-----------------|----------|
| | Standard | Optional |
| 70 - 225 | 25 | 35 |
| 250 | 25 | 35 |
| 400 | 35 | 35 |
| 600, 800 | 65 | N/A |
| 1000, 1200 | 65 | N/A |
| 1600, 2000 | 65 | 100 |
| 2500, 3000 | 100 | N/A |
| 4000 | 100 | N/A |

- Notes:**
- Unit is designed for top and bottom cable entry for all services and load.
 - Enclosures for 600 – 3000 amps are free standing.
 - When temperatures below 32° F can be experienced, special precautions should be taken, such as the inclusion of strip heaters, to prevent condensation and freezing of this condensation. This is particularly important when environmental enclosures (Type 3R, 4 & 12) are ordered for installation outdoors.
 - Dimensional data is approximate and subject to change. Certified dimensions available upon request.

ASCO® 7000 SERIES Microprocessor Controller



Fig. 14: 7000 SERIES
Microprocessor Controller.

The 7000 SERIES Microprocessor Based Controller is used with all sizes of Power Transfer Switches from 30 through 4000 Amperes. It represents the most advanced digital controller in the industry and includes, as standard, all of the voltage, frequency, control, timing and diagnostic functions required for most emergency and standby power applications.

Because of severe voltage transients frequently encountered with industrial distribution systems, the microprocessor logic board is separated and isolated from the power board as shown below. This improves electrical noise immunity performance and helps assure compliance with the rigorous transient suppression standards highlighted below.

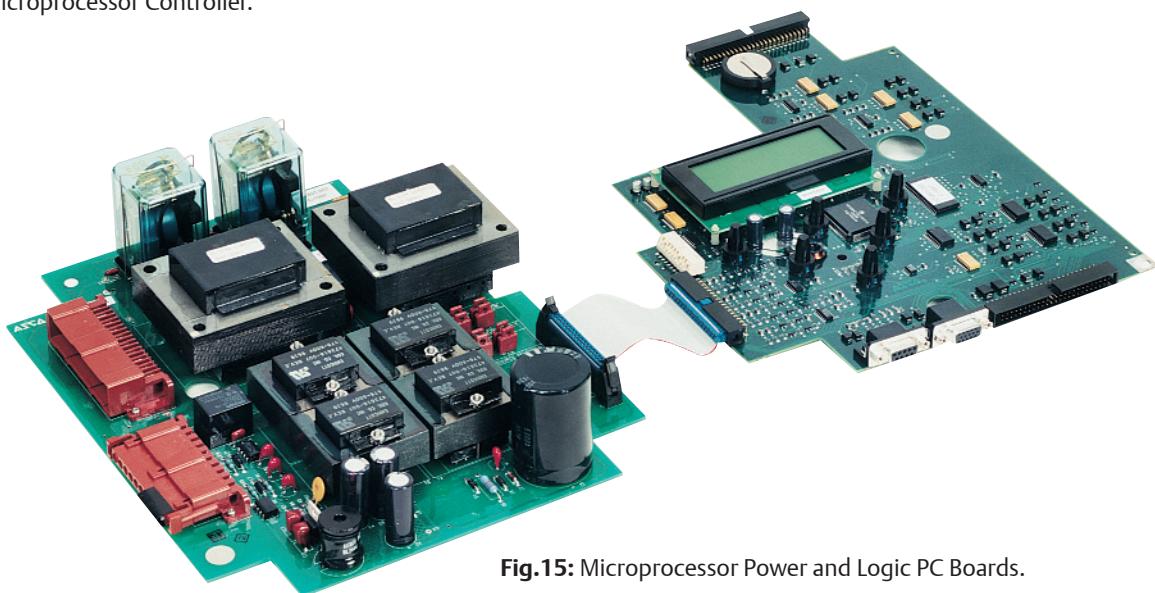


Fig.15: Microprocessor Power and Logic PC Boards.

7000 SERIES Microprocessor Based Controller

| | |
|---|--------------------|
| Emission Standard - Group 1, Class A | EN 55011:1991 |
| Generic Immunity Standard, from which: | EN 50082-2:1995 |
| Electrostatic Discharge (ESD) Immunity | EN 61000-4-2:1995 |
| Radiated Electromagnetic Field Immunity | ENV 50140:1993 |
| Electrical Fast Transient (EFT) Immunity | EN 61000-4-4:1995 |
| Surge Transient Immunity | EN 61000-4-5:1995 |
| Conducted Radio-Frequency Field Immunity | EN 61000-4-6:1996 |
| Voltage Dips, Interruptions and Variations Immunity | EN 61000-4-11:1994 |

Features

- Digital microprocessor.
- Touch pad programming of features and settings without the need for meters, or variable power supplies.
- Sixteen (16) selectable operating voltages available in a single Controller.
- On-board diagnostics provide control panel and ATS status information to analyze system performance.
- Displays and counts down active timing functions.
- Selectable multi-language display (English, German, Portuguese, Spanish, or French. For others contact ASCO).
- Password protection to prevent unauthorized tampering of settings.
- Remote monitoring and control with ASCO POWERQUEST® communications products. Specify optional accessory 72A or 72E.
- Load shed option for bus optimization applications. Specify optional accessory 30B.
- Historical event log
- Statistical ATS systems monitoring information

Voltage and Frequency Sensing

- 3-Phase under and over voltage settings on normal and emergency sources.
- Under and over frequency settings on normal and emergency.
- True RMS Voltage Sensing with +/- 1% accuracy; Frequency Sensing Accuracy is +/- 0.2%.
- Selectable settings: single or three phase voltage sensing on normal and emergency; 50 or 60Hz.
- Phase sequence sensing for phase sensitive loads.
- Voltage unbalance detection between phases.

Status and Control Features

- Output contact (N/O or N/C) for engine-start signals.
- Selection between "commit/no-commit" on transfer to emergency after engine start and normal restores before transfer.
- Advanced inphase algorithm which automatically measures the frequency difference between the two sources and initiates transfer at appropriate phase angles to minimize disturbances when transferring motor loads.
- Event log displays 99 logged events with the time and date of the event, event type and event reason.
- Output signals for remote indication of normal and emergency source acceptability
- Statistical ATS/System monitoring data screens which provide:
 - Total number of ATS transfers.
 - Number of ATS transfers caused by power source failure.
 - Total number of days ATS has been in operation.
 - Total number of hours that the normal and emergency sources have been available.

Time Delays

- Engine start time delay - delays engine starting signal to override momentary normal source outages - adjustable 0 to 6 seconds.
- Transfer to emergency time delay - adjustable 0 to 60 minutes.
- Emergency source stabilization time delay to ignore momentary transients during initial generator set loading - adjustable 0 to 6 seconds.
- Retransfer to normal time delay with two settings:
 - Power failure mode - 0 to 60 minutes.
 - Test mode - 0 to 10 hours.
- Unloaded running time delay for engine cooldown - adjustable 0 to 60 minutes.
- Pre and post transfer signal time delay for selective load disconnect with a programmable bypass on source failures - adjustable 0 to 5 minutes. This signal can be used to drive a customer furnished relay, or for (2) sets of double throw contacts rated 3 amps at 480 volts AC, specify ASCO optional accessory 31Z.
- Fully programmable engine exerciser with seven independent routines to exercise the engine generator, with or without loads, on a daily, weekly, bi-weekly or monthly basis.
- Contains all alarm signals, logic and time delays for use with closed transition switches.
 - Insynch time delay - 0 to 3 seconds.
 - Failure to synchronize - 1 to 5 minutes.
 - Extended parallel - 0.1 to 1.0 seconds.
- Delayed transition load disconnect time delay - adjustable 0 to 5 minutes.

ASCO® 7000 SERIES User Controls and Indicators

Control Switches and Indicating Lights for Conventional 2-Position Switches

- Switch position indicating lights (16 mm, industrial grade LEDs).
- Source acceptability indicating lights with true indication of the acceptability of each source, as determined by the voltage, frequency, voltage unbalance, and phase sequence settings of the control panel (16mm, industrial grade LEDs).
- Three position (16mm, industrial grade type) selector switch:
 - Automatic: Normal maintained position.
 - Test: Momentary position to simulate normal source failure for system test function.
 - Reset Delay Bypass: Momentary position to bypass transfer and re-transfer time delay.



Fig. 16: 7000 SERIES User Controls and Indicators.

Control Switches and Indicating Lights for Closed Transition Switches

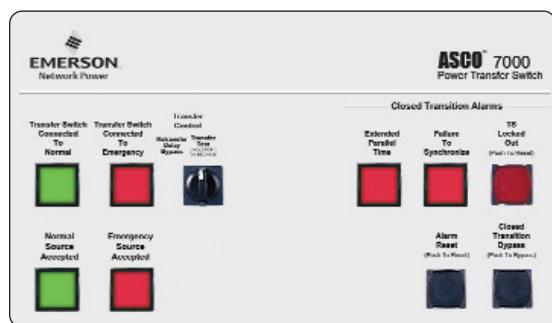


Fig. 17: 7000 SERIES User Controls and Indicators.

- Extended Parallel Time - Provides visual indication when the pre-set extended parallel time has been exceeded. The controls automatically open the emergency or normal main contacts. Separate contact also available to shunt trip external breaker.
- Failure To Synchronize - Visually displays a failure to synchronize alarm if the time delay settings is exceeded, during closed transition transfer operation.
- TS Locked Out - Prevents transfer in either direction if the extended parallel time is exceeded.
- Alarm Reset - Resets extended parallel and failure to synchronize alarms.
- Closed Transition Bypass - Pushbutton allows transfer between sources in an open transition mode.

7000 SERIES Power Control Center



Fig. 18: 7000 SERIES Power Control Center.

The 7000 SERIES microprocessor controller is a Power Control Center which allows the user to easily access detailed information on: system status; power source parameters; voltage, frequency and time delay settings; optional feature settings; historical event log; and system diagnostics. A four line, (20) character LCD has a backlit display which enables easy viewing under all conditions. The user can navigate through all screens using only six buttons, which also allows selection of: (18) different source parameter settings; (16) standard time delays; (12) standard feature settings; up to seven independent engine exercise routines; and even the language (English, German, Spanish, French, etc.) which appears on the display.

Since the Power Control Center must be visible and operable through the enclosure door, it has been qualified for use in industrial and outdoor applications. This includes installation in Type 3R (outdoor/rainproof), 4 (weatherproof) and 12 (indoor/industrial) enclosures. For applications with regular exposure to direct sunlight a double door for UV protection is recommended.

ASCO® 7000 SERIES Power Control Center Screens

Status

| | |
|---|---|
| <p>System Status</p> <div style="border: 1px solid black; padding: 10px; background-color: #ffffcc;"> Normal OK Load on Normal </div> <p>Displays system status in clear, concise language. Message shown indicates normal source is acceptable and the load is connected to the normal source.</p> | <p>Source Status</p> <div style="border: 1px solid black; padding: 10px; background-color: #ffffcc;"> Normal Source Vab=480V.....ABC Vbc=480V.....Vunbal=1% Vca=480V.....60.0Hz </div> <p>Displays voltage for each phase, frequency, phase rotation and voltage unbalance for both normal and emergency sources.</p> |
| <p>Time Delay Status</p> <div style="border: 1px solid black; padding: 10px; background-color: #ffffcc;"> Normal OK TD.Engine.Cooldown: 4min15s </div> <p>Active time delay status displays time remaining until next control event.</p> | <p>Inphase Transfer Mode</p> <div style="border: 1px solid black; padding: 10px; background-color: #ffffcc;"> Emerg OK Waiting for In-Sync -45° 0.02Hz </div> <p>Displays the relative phase angle between sources and frequency differential to indicate the controller is awaiting an inphase condition.</p> |

Settings

| | |
|--|--|
| <p>Voltage and Frequency Settings</p> <div style="border: 1px solid black; padding: 10px; background-color: #ffffcc;"> Normal Voltage Dropout.....85%.408V Pickup.....90%.432V O.V. Trip.....110%.528V </div> <p>Provides voltage and frequency setting values for normal and emergency sources. Voltage pick-up, dropout and trip settings are set in percentage of nominal voltage and are also displayed in rms voltage values.</p> | <p>Time Delay Settings</p> <div style="border: 1px solid black; padding: 10px; background-color: #ffffcc;"> TD N>E Xfer Signal Bypass if N Fail: No Pre Xfer: 0 min 20S Post Xfer: 0 min 20S </div> <p>Provides direct reading display for setting time delays.</p> |
| <p>Engine Exerciser</p> <div style="border: 1px solid black; padding: 10px; background-color: #ffffcc;"> P1.....Engine.Exerciser Enable:....Yes....WLoad:....Yes Start:19h30. ALL MON Run.Time:.....2h15min </div> <p>Seven independent programs, load/no load selection, flexible run times and daily, weekly, bi-weekly and monthly exercise routines.</p> | <p>Feature Settings</p> <div style="border: 1px solid black; padding: 10px; background-color: #ffffcc;"> Shed Load Direction: From E Inphase: No TD/0.25 </div> <p>Standard features can be activated with the keypad. As an example, when enabled, the “shed load” option causes the transfer switch to transfer the load off of the specified source. If desired, the load shed transfer can be made inphase.</p> |

Data Logging

| | |
|---|---|
| <p>ATS Statistics</p> <div style="border: 1px solid black; padding: 10px; background-color: #ffffcc;"> ATS Statistics ATS Total Xfers: 46 SRC Fail Tot Xfers: 20 Days Energized: 36.5 </div> <p>Instant availability of statistical information on total number of ATS transfers, number of transfers caused by power failures and total days controller has been energized, plus more.</p> | <p>Historical Event Log</p> <div style="border: 1px solid black; padding: 10px; background-color: #ffffcc;"> 16.AUG02/95.....13h10:17 Eng.Start.....NormFail. 15.AUG02/95.....13h10:25 Xfer.N>E..... </div> <p>Displays detailed information for last 99 events, including time of occurrence, length of event, date and reason for event.</p> |
|---|---|

ASCO® 7000 SERIES Optional Accessories

Time Delays

- 2C** Provides an extended time delay on engine starting. The standard feature one time delay is adjustable from zero to six seconds. Accessory 2C allows this time delay to be adjustable from zero to sixty minutes in one second intervals factory set at five minutes.
- 1G** Similar to accessory 2C except using 24 volt DC external input signal. 7000 SERIES controller remains active when both power sources are de-energized

Manual Controls for Automatic Transfer Switches

- 6C** Reset switch for manual retransfer to normal with automatic retransfer in the event of emergency source failure.
- 6D** Selector switch for automatic/manual retransfer to normal. Automatic bypass if emergency fails.

Engine Generator Controls and Accessories

- 12** Three position engine control selector switch.
Positions: 1-Stop 2-Automatic 3-Engine Test

Note: Switches with accessory 12 must be labeled as a non-automatic transfer switch according to UL 1008.

Engine controls containing "engine stop" positions should be located at the engine generator. (Consult ASCO for application assistance.)

Indicators

- 14A/14B** Additional auxiliary contact sets to indicate switch position. Two sets are standard. Specify total number of sets if more are required.
- 18B** Two-pole, double-throw contacts operate when emergency source voltage is present at transfer switch terminals.
- 18G** Two-pole, double-throw contacts operate when normal source voltage is present at transfer switch terminals.
- 99** "Push-to-Test" feature on all pilot light indicators.

Customer Control Circuits

- 30A** Load-shedding circuit initiated by opening of a customer-supplied contact.
- 30B*** Load-shedding circuit initiated by removal of customer-supplied control voltage. *(Specify voltage).
- 31Z** Selective load disconnect control contacts (two provided) which operate with time delay prior to and/or after load transfer and retransfer.
- 43R** Terminal block for all customer control connections on 30-150 amp only (standard on all other sizes).

Note: An externally operable quick-make, quick-break (QMQB), manual handle is available on some 7000 SERIES product configurations. (Consult ASCO for guidance.)

Neutral Conductor Options

- Solid neutral, with fully-rated terminals. (AL-CU) UL Listed.
- Conventional neutral switching pole.
- Overlapping neutral transfer contacts. Allows for proper ground-fault sensing and avoids generator voltage transients during transfer.

Note: Specify neutral option in catalog number, see page 21 for instructions.

Extension Harness

- 37B** Six foot (6') extension harness to increase distance between transfer switch and control panel on open-type units.

Analog Load Metering Options

- 23B** Three phase ammeter with selector switch (with current transformers and shorting blocks).
- 24B** Three phase voltmeter with selector switch.

Note: Refer to ASCO 5200 SERIES Power Manager on page 15 which provides voltage, frequency and power monitoring.

Serial Communications

- 72A** Serial communication module for remote communications to ASCO POWERQUEST® products.
- 72E** Serial to Ethernet converter with embedded web pages

Surge Protection

ASCO Pulsar 450 rated 65KA

- 73AC1** Normal source protection. (3Ø, 4wire WYE)
- 73AC2** Emergency source protection. (3Ø, 4wire WYE)
- 73AC3** Load side protection. (3Ø, 4wire WYE)

Note: Other distribution voltages available (Contact ASCO).

Special Applications

- 111A** Generator - to - Generator for Standby Applications
- 111B** Generator - to - Generator for Prime Power Applications
- 125** Seismic Certification to the requirements of the international building code for electrical equipment
- 131** Certification of compliance with the American Recovery & Reinvestment ACT (Buy American Provision)
- Must be specified at time of order placement

Bypass-Isolation Switch Options

- 14A1** Auxiliary contact to close in "Bypass to Normal" position.
- 14B1** Auxiliary contact to close in "Bypass to Emergency" position.
- 14T** Auxiliary contact to close when transfer switch is in "Automatic" position.
- 14U** Auxiliary contact to close when transfer switch is in "Isolate" position.
- 14V** Auxiliary; contact to close when transfer switch is in "Test" position.
- 82C** Automatic shutters for bus isolation when transfer switch is withdrawn. (see page 6 for details)
- 82E** LED Bypass status indicator, optional on G frame 1600A-4000A only. Standard for all other size switches

ASCO® 7000 SERIES Optional Accessories

ASCO 5200 SERIES

Power Manager

The ASCO 5200 SERIES Power Manager is a microprocessor based metering device that provides real-time measurements of single and three phase power systems. The Power Manager uses digital signal processing technology to measure voltage and current per phase; real, reactive and apparent power, and bi-directional energy. All measurements can be viewed locally with a backlit liquid crystal display and/or displayed remotely with ASCO POWERQUEST® products.

Direct voltage input for systems up to 600 Volts AC can be monitored without the use of external potential transformers (PTs). Measures three phase currents and a fourth current input is available for measuring current in the neutral conductor. The Power Manager includes one discrete input for transfer switch position, eight general purpose discrete inputs, and four relay outputs for monitoring and controlling external devices.

Power Metering

- Voltage:
Line - Line: VAB, VBC, VCA, VAVERAGE
Line - Neutral: VAN, VBN, VCN, VAVERAGE
- Frequency: 45.0 to 66.0 Hertz
- Current: IA, IB, IC, IAVERAGE
- Unbalance %: Voltage, Amps
- Real Power: KWA, KWB, KWC, KWNET
- Reactive Power: KVARA, KVARB, KVARC, KVARNET
- Apparent Power: KVAA, KVAB, KVAC, KVANET
- Real Energy: KWHIMPORT, KWEXPORT, KWHNET
- Reactive Energy: KVARHIMPORT, KVAREXPORT, KVARHNET
- Power Factor: PFA, PFB, PFC, PFNET

Data Access

- Eight digital inputs, four relay outputs.
- Input/Output 15-character, user definable screen display for identification of input/output signals.

Communications

- RS485 (2) or (4) wire serial capability.
- Includes Modbus RTU.
- Ethernet compatible when combined with 5150 Connectivity Module (72E).

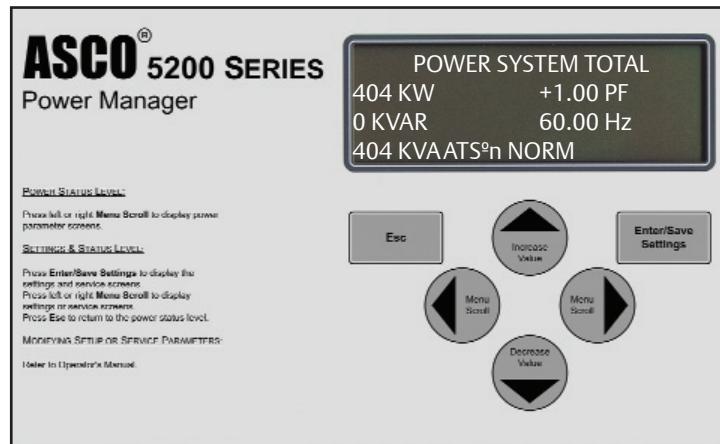


Fig. 19: ASCO 5200 SERIES Power Manager.

Configurable Designations

- Local - A four line, 20 character LCD backlit display.
- Remote - Integrated 4 wire RS485 port; optional 5110 Serial Module (72A) or 5150 Communications Module (72E) and power manager monitoring systems.
- Provides user programmable setpoints based on twelve metering and I/O parameters. Each setpoint allows the user to select the parameter, the trip & reset levels, the trip & reset time delays and the alarm type or relay output to trigger. This can be used for protective relaying and peak shaving applications.
- 100 event data logging feature.

Integrated ATS Features

When configured on load of ATS:

- Displays ATS position.
- Displays power data as a function of ATS position (normal/emergency).
- Accumulates energy data separately for normal and emergency sources.

Optional Configurations and Connection Arrangements

| Connected To: | With Display | Without Display |
|-----------------|--------------|-----------------|
| Load | Acc. 85L | Acc. 75L |
| Normal | Acc. 85N | Acc. 75N |
| Emergency | Acc. 85M | Acc. 75M |
| Load (BPS only) | Acc. 85R* | Acc. 75R* |

Add suffix "A" to above designations if neutral conductor monitoring is required.

Note: Accessory 75 and 85 includes component mounting, CTs, shorting blocks and all necessary interwiring.

*Bypass & isolation switch contacts wired to discrete Power Manager inputs.

Note: The ASCO Power Manager is also available as a separate unit for monitoring electrical parameters anywhere in the power distribution system.

ASCO® 7000 SERIES Power Monitoring & Control

ASCO POWERQUEST® Solutions

ASCO POWERQUEST® communications products allow for the monitoring and control of power transfer switches in your Emergency or Standby Power Distribution System. Local Area networks and Remote networks are supported with either single or multiple points of access, and web-enabled communications allow access to your power system from anywhere around the world.

Features

- Monitors and controls Power Transfer Switches and Engine Generators
- Monitors normal and emergency voltages and frequency
- Indicates transfer switch position and source availability
- Provides transfer and re-transfer of loads for system testing
- View normal and emergency voltage and frequency settings
- View transfer switch time-delay settings
- Provides transfer switch rating and identification
- Automatic paging notifies personnel, by e-mail or text message, of selected system alarms
- View current, power and power factor with ASCO Power Managers Connected to the System
- View transfer switch event log
- Provides transfer switch test schedule

ASCO® POWERQUEST® Typical Network Architecture

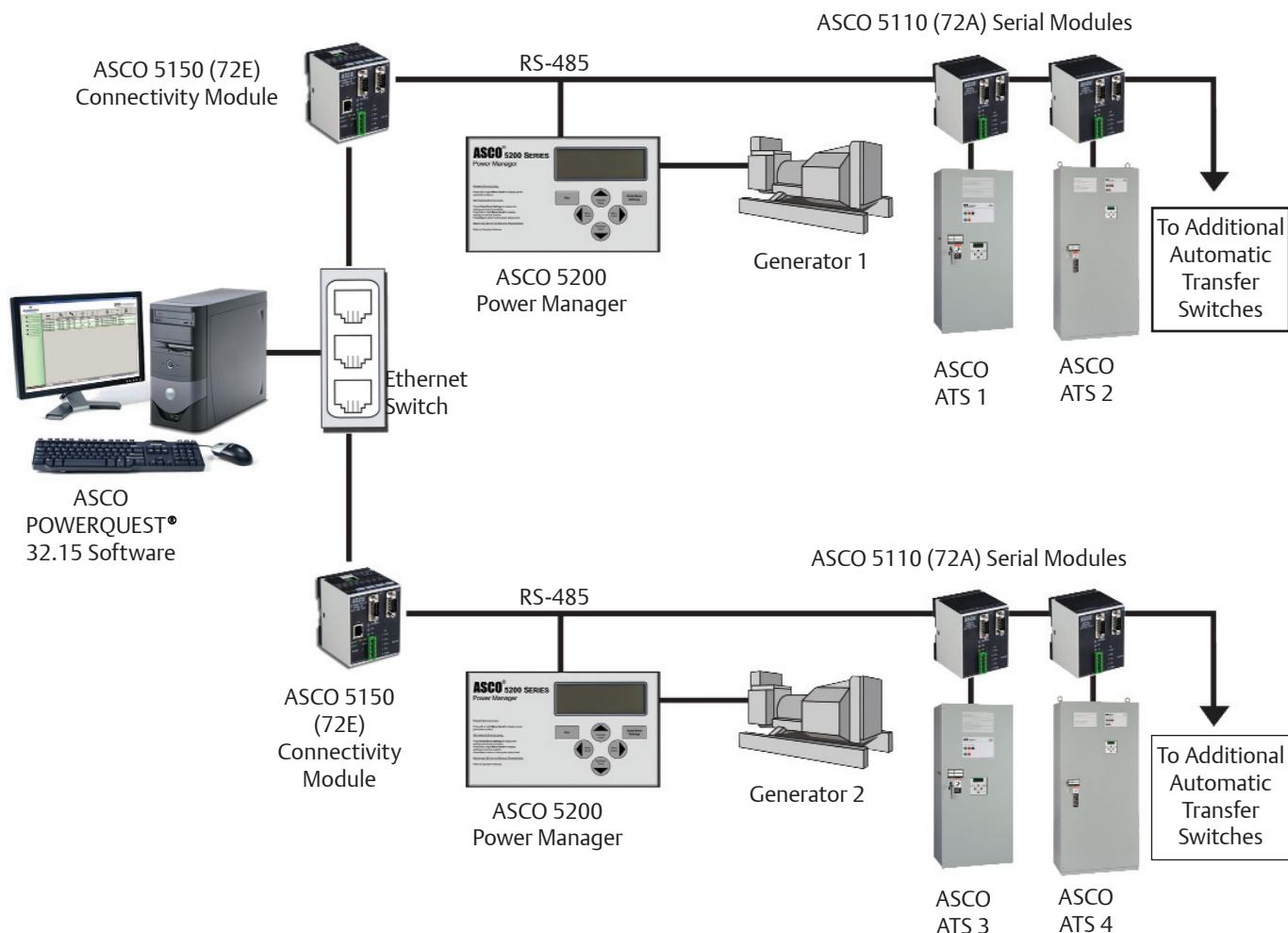




Fig. 20: Serial Module 72A



Fig. 21: Connectivity Module 72E



Fig. 22: ASCO Remote Annunciator



Fig. 23: ASCO Power Quality and Energy Meter

5110 Serial Module

The 5110 Serial Module is used to allow local or remote communications with ASCO POWERQUEST® communication products.

The module is used to connect the 7000 SERIES transfer switches to a serial network via an RS-485 interface. The module has two port connectors used for ATS & Power Manager connectivity.

The serial connection is accomplished from a 5-pin terminal header/socket block. RS- 485 serial networks allow for up to 32 modules to be set up in a daisy chain configuration to connect to POWERQUEST® systems.

5150 Connectivity Module

The 5150 Connectivity Module is used to bring several different serial devices that communicate at different baud rates and with different protocols to a common Ethernet media.

The module is used to connect 7000 SERIES transfer switches, and ASCO Remote Annuciators to a standard Ethernet TCP/IP network with standard 10base T (RJ-45) connectors. The module has customized embedded JAVA™ applets (program applications for an internet browser) for each monitored device that loads automatically to a standard Web Browser.

The module is designed to communicate with up to 8 clients such as Web applications (web pages), POWERQUEST®, or third party Modbus® devices simultaneously over an Ethernet connection.

5350 Remote Annunciator

The ASCO Power Transfer Switch Remote Annunciator is a stand-alone, industrial grade interface device providing you with the most critical transfer switch status indication and transfer/retransfer control for up to eight switches. Ethernet technology is built in for faster and more reliable communications. LEDs indicate switch status and position, while separate push buttons individually initiate transfer switch operation and testing. Transfer switch annunciators can be set up in multiple locations to monitor various transfer switches, allowing redundant and distributed annunciation.

Accessory 113S

Accessory 113S is an advanced power quality and energy meter providing intelligent power analysis, energy measurement and event recording for critical and sensitive loads. It improves response to power quality-related issues by continuously monitoring and recording harmonics, sags/swells and disturbances.

Power uptime is captured, computed and displayed in a simple number of 9s format. A large built-in LCD display allows viewing of all parameters locally or remotely over Ethernet (Acc. 113SE).

On-board memory stores up to 500 events, 1.5-years of data, and 360 waveforms at a sampling rate of 1024 samples per cycle or 1 ms timestamp resolution.

ASCO® POWERQUEST 32.15

ASCO 32.15 POWER INTERFACE SOFTWARE

The ASCO 32.15 Power Interface is a computer-based monitoring and control software package. When combined with ASCO 72E/72A Communications Interface modules and the ASCO 5200 SERIES Power Manager, it provides a centralized and comprehensive monitoring and control interface of power transfer switches and engine generators. A one-line diagram, power metering information, transfer switch controls and event-log data, and engine-generator screens are available to users with password protected controls.

Summary Screen

This screenshot shows the 'Summary Screen' of the ASCO POWERQUEST software. On the left, there is a sidebar titled 'EMERSON Network Power' with a 'Power Manager List' containing several entries. The main area displays a table titled 'ASCO POWERQUEST Power Monitoring and Control'. The table has columns for IP, Name, SW, Valve, Amps, KW, Freq, PT, Load Status, and Location. The data in the table includes:

| IP | Name | SW | Valve | Amps | KW | Freq | PT | Load Status | Location |
|-----------------|---------|------|-------|------|------|-------|------|-------------------|----------|
| 155.104.006.204 | Gp5_204 | OTTS | 118 | 0 | 0.00 | 0.00 | 0.00 | Load is in Normal | Rack |
| 155.104.006.217 | Gp5_217 | OTTS | 116 | 0 | 0.00 | 0.00 | 0.00 | Load is in Normal | SW LAB |
| 155.104.006.218 | Gp5_218 | OTTS | 116 | 1339 | 118 | 60.00 | 0.86 | Load is in Normal | Rack 532 |
| 155.104.006.220 | Gp5_220 | O11S | 116 | 0 | 0.00 | 0.00 | 0.00 | Load is in Normal | Rack 519 |

At the bottom of the screen, there are three tabs: 'NETWORK SUMMARY', 'ATS STATUS', and 'POWER MANAGER STATUS'.

Current and Historical Alarms

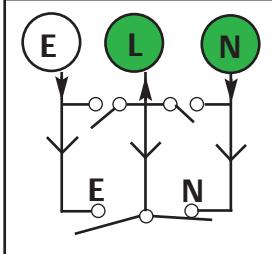
The Current Alarm screen displays all currently active alarms. It provides the date of the alarm, along with IP and Name of the device with the issue. In addition, a detailed description of the alarm is provided to help the operator in pinpointing the issue. All historical alarms can be viewed as well by selecting the "Historical" tab.

This screenshot shows the 'CURRENT' tab of the 'Alarms' screen in the ASCO POWERQUEST software. It lists current alarms with columns for Date, IP, Name, and Details. The details column provides a brief description of the alarm condition. The data is as follows:

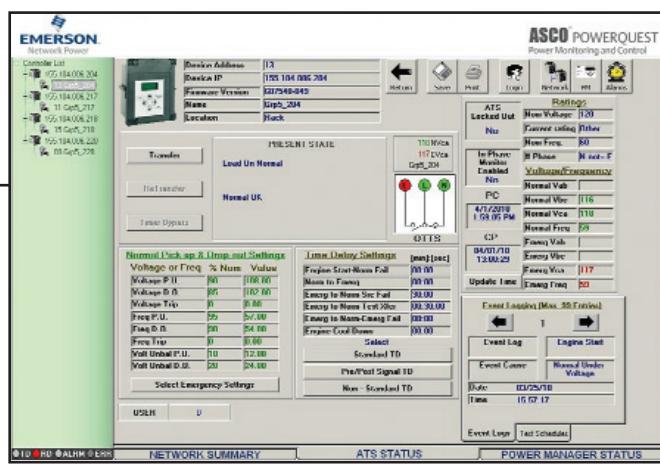
| Date | IP | Name | Details |
|----------------------|-----------------|---------|---|
| 3/1/2009 3:17:52 PM | 155.104.6.214.1 | ATS 4a | Relay Output 1b |
| 3/1/2009 8:54:39 AM | 155.104.6.228.1 | ATS 1b | Engine start signal detected |
| 3/1/2009 8:54:46 AM | 155.104.6.228.1 | ATS 1b | ATS transferred to Emergency Source |
| 3/1/2009 8:55:05 AM | 155.104.6.228.1 | ATS 1b | ATS retransferred back to Normal Source |
| 5/6/2009 11:12:09 AM | 155.104.6.235.1 | _235_01 | Engine start signal detected |
| 5/6/2009 11:13:05 AM | 155.104.6.235.1 | _235_01 | ATS transferred to Emergency Source |
| 5/6/2009 11:18:05 AM | 155.104.6.235.1 | _235_01 | ATS retransferred back to Normal Source |

Convenient One-Line Diagram

- Colored icons highlighted to show source availability and which source is connected to load.
- Contacts move on icon to indicate main contact position of transfer and bypass switch. (Automatic transfer and bypass isolation switches must be provided with optional accessory 85R seen on page 15.)
- Bypass switch contacts appear on icon when configured by user input data.

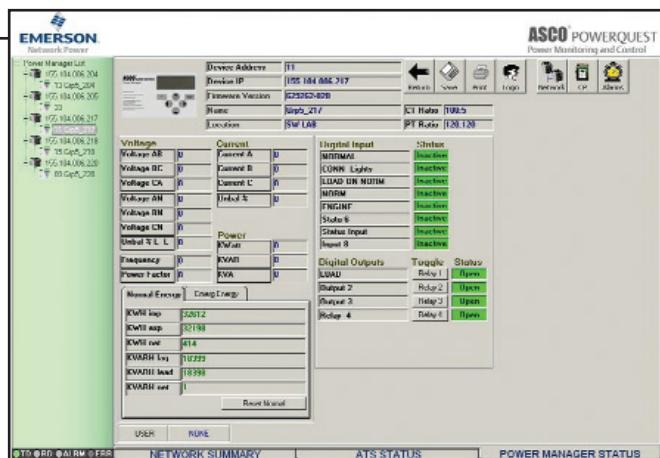


ASCO® POWERQUEST 32.15



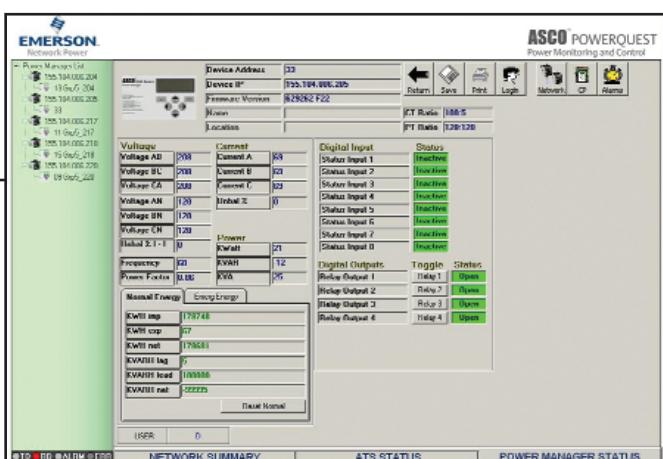
Transfer Switch Detail Screen

- ATS rating and identification data is displayed.
- Allows remote testing and time delay bypass.
- Voltage, frequency, phase sequence, voltage unbalance and time delay settings can be checked.
- Viewing of engine exercise schedules.
- Displays phase to phase voltage on normal and emergency.
- Provides complete system status message from 7000 series microprocessor controller.
- View event log on the last 99 events for each ATS.
- Arrange test schedules for transfer switches.
- Provides for monitoring of local site or remote sites.



Power Manager Detail Screen

- Voltage: phase to phase; phase to neutral and voltage unbalance.
- 3 phase currents and neutral (optional).
- Frequency.
- Kilowatt hours - normal and emergency.
- Status and control of four relay outputs.
- Status of eight digital inputs.
- Device ratings: CT and PT ratio.



Engine-Generator Details

- Voltage: Phase to phase; Phase to neutral.
- Current for each phase.
- Kilowatts and kilowatt hours total.
- Frequency and power factor.
- Status and control of four digital outputs which can be customized by the user.
- Status of eight digital inputs.
- “Alarm Enabled” selection. These alarms flash the “engine-generator” icon on the summary screen.
- Digital inputs for engine malfunctions are derived from engine mounted sensors (supplied by others).

ASCO® POWERQUEST Solutions

5500 SERIES Thin Web Server

The ASCO Thin Web Server is an internet-based thin client application, which provides monitoring and control of transfer switches and engine generators from anywhere in the world. With ASCO 72E/72A Communications Interface modules and ASCO 5200 SERIES Power Managers, it brings the power interface to your browser with your user name and password. Alarms and event logs are provided through the browser, while simultaneously transmitting an email indicating that an alarm has occurred with one or more transfer switches.



Fig. 24: Thin Web Server

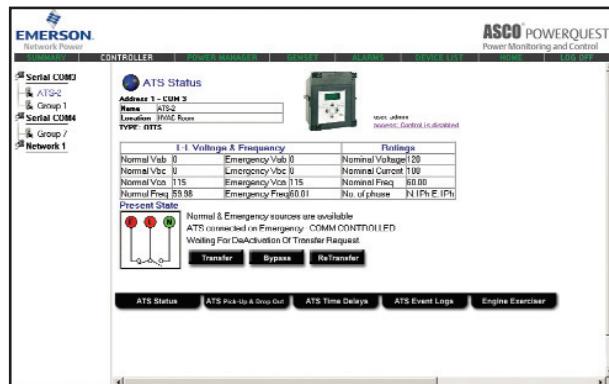


Fig. 25: Thin Web's html interface screen shot

Communications Products for 7000 SERIES Transfer Switches

| Description | Acc. Option | Catalog No. |
|-----------------------------|-------------|-------------|
| Serial Module | 72A | 5110 |
| Connectivity Module | 72E | 5150 |
| Power Manager with Display* | 85L | 5220D |
| Thin Web Server* | — | 5510E |
| Software Package* | — | 32.15 |

* These products are available as separate items only. They can be ordered by catalog numbers shown in above chart.

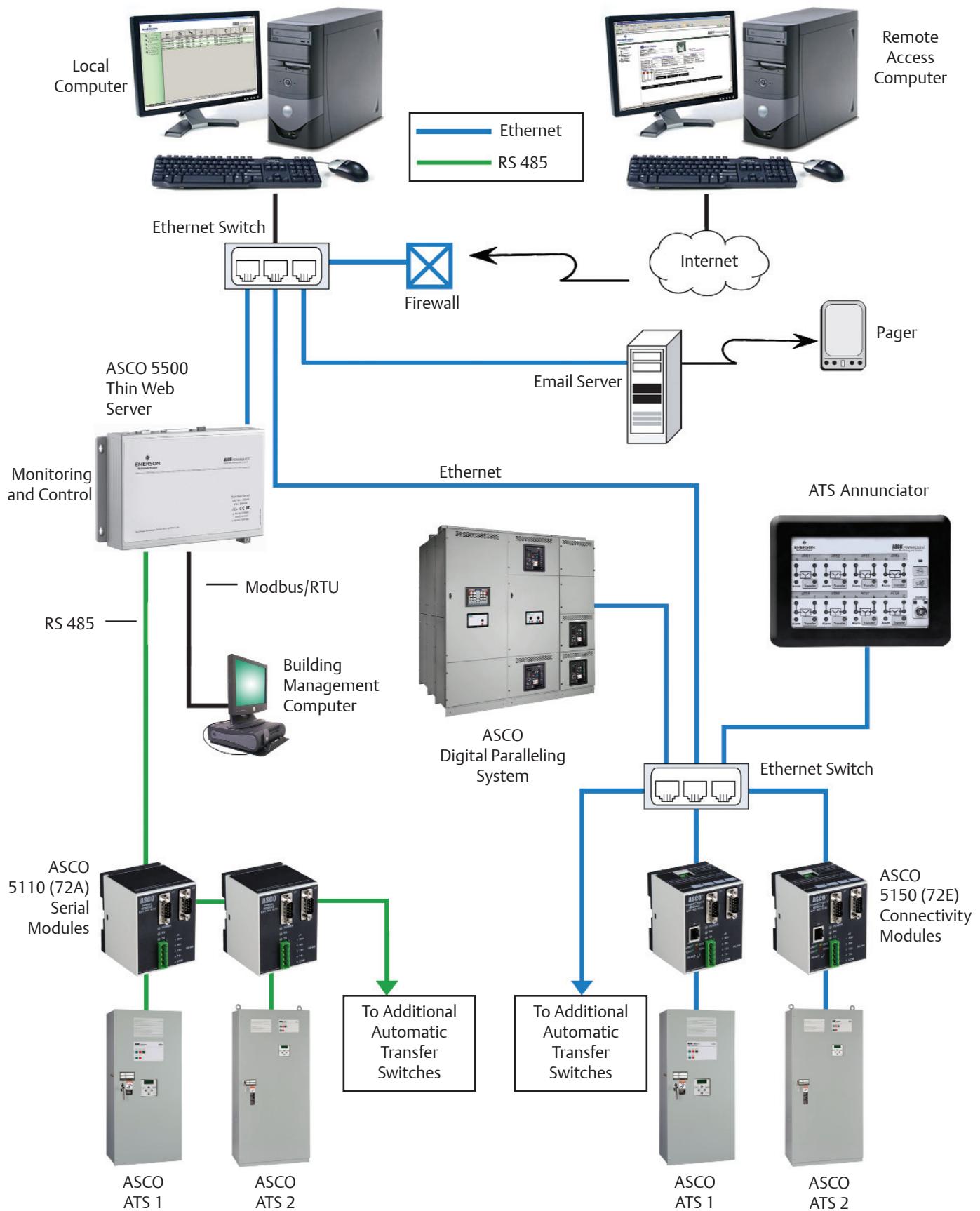
ASCO® POWERQUEST Solutions Comparison

| ASCO Connectivity Solution Guide Feature | POWERQUEST® 32.15 | 5500 Thin Web Server | 5150 Connectivity Module | 5350 Remote Announcer |
|--|-------------------|----------------------|--------------------------|-----------------------|
| Quantity of Monitored / Controlled Power Transfer Switches per LAN | 32 | 64 | 1024+ | 8 |
| Number of Monitored / Controlled Gensets | 4 | 8 | 1024+ | 0 |
| Control & Monitoring Capability | Yes | Yes | No | Yes |
| Embedded Web Pages | No | Yes | Yes | Yes |
| Ethernet Network Compatible | Yes | Yes | Yes | Yes |
| Monitor Multiple Protocols & Baud Rates (ASCO I, ASCO II, Modbus) | No | No | Yes | Yes |
| Monitor Multiple Sites | Intranet | Internet | Intranet | Intranet |
| Multiple Client Access | No | Up to 8 | Up to 8 | Up to 8 |
| Client Software Required | Yes | Internet Explorer | Internet Explorer | Internet Explorer* |
| Monitors Dissimilar ASCO Controllers on Common LAN | No | No | Yes | Yes |
| Communicates with ASCO Remote Announciators | No | No | Yes | Yes |
| Email / Paging Alarms | No | Yes | No | No |
| Historical Trending Option Alarms | No | Yes | No | Yes ** |

* Internet Explorer only required for initial communications setup.

** Historical trending not available on Remote Announcer.

ASCO® POWERQUEST Solutions



ASCO® 7000 SERIES Ordering Information

To order an ASCO 7000 SERIES Power Transfer Switch, complete the following catalog number:

| 7 | A | TS | + | A | + | 3 | + | 400 | + | N | + | 5X | + | C |
|---|-------------------|---------|---------------------------|----------------|---------------------|-------------|---------|-----|--------------|----------------------|----------|---|---|---|
| | | Product | | Neutral Code * | | Phase Poles | Amperes | | Voltage Code | | Grp Code | Enclosure | | |
| A | Automatic | TS | Conventional 2-Position | --- | No Neutral | 2 | 30 | A | 115 | 5 | --- | No enclosure | | |
| | | TB | Open Transition Bypass | A | Solid Neutral | 3 | 70 | B | 120 | 5X- | C | Type 1 enclosure | | |
| N | Non-Automatic | CTS | Closed Transition | | | | 100 | C | 208 | optional accessories | F | Type 3R enclosure | | |
| M | Manually Operated | CTB | Closed Transition Bypass | B | Switched Neutral | | 150 | D | 220 | | G | Type 4 enclosure | | |
| | | DTS | Delayed Transition | | | | 200* | E | 230 | | H | Type 4X enclosure (stainless steel) | | |
| | | DTB | Delayed Transition Bypass | C | Overlapping Neutral | | 230* | F | 240 | | L | Type 12 enclosure | | |
| | | | | | | | 260 | G | 380 | | M | Type 3R secure double door | | |
| | | | | | | | 400 | H | 400 | | N | Type 4 secure double door | | |
| | | | | | | | 600 | I | 415 | | P | Type 4X secure double door | | |
| | | | | | | | 800 | J | 440 | | Q | Type 12 secure double door | | |
| | | | | | | | 1000 | K | 460 | | R | Type 3RX secure double door (Stainless Steel) | | |
| | | | | | | | 1200 | L | 480 | | | | | |
| | | | | | | | 1600 | M | 550 | | | | | |
| | | | | | | | 2000 | N | 575 | | | | | |
| | | | | | | | 2600 | O | 600 | | | | | |
| | | | | | | | 3000 | | | | | | | |
| | | | | | | | 4000 | | | | | | | |

*Notes: Conventional switch neutral is provided on delayed transition transfer products when specified.

200 and 230 amp switch limited to 480 volts maximum, on 7ATS, 7CTS and 7DTS only.

The Example Catalog Number above is 7ATSA3400N5XC
(X is used to specify optional accessories).

Transfer Switch Configurations

7A TS, 7N TS, 7A DTS, 7A CTS, 7N DTS, 7N CTS

Sizes of UL-Listed Solderless Screw-Type Terminals for External Power Connections

| Switch Rating amps | Max # of Conductors per Terminal | Range of AL-CU Conductor Sizes |
|-------------------------|----------------------------------|--------------------------------|
| 30 -230 ³ | One | #14 to 4/0 AWG |
| 260-400 | One | #4 AWG to 600 MCM |
| | Two | #1/0 AWG to 250 MCM |
| 600 | Two | #1/0 AWG to 600 MCM |
| 800-1200 ¹ | Four | #1/0 AWG to 600 MCM |
| 1600-2000 ² | Six | #1/0 AWG to 600 MCM |
| 2600, 3000 ² | Twelve | #1/0 AWG to 600 MCM |
| 4000 ² | Twelve | #2/0 AWG to 600 MCM |

Notes: 1. Unit is designed for top cable entry of emergency and load and bottom entry of normal. Optionally, the switch may be supplied with reverse source and/or bottom entry load, when specified.

2. All main terminals are rear connected.

Transfer/Bypass Configurations

7A TB, 7N TB, 7A DTB, 7A CTB, 7N DTB, 7N CTB

Sizes of UL-Listed Solderless Screw-Type Terminal for Power Connections

| Switch Rating amps | Max # of Conductors per Terminal | Range of AL-CU Conductor Sizes |
|----------------------------|----------------------------------|--------------------------------|
| 150, 200, 230 | One | # 4 AWG to 600 MCM |
| | Two | # 1/0 AWG to 250 MCM |
| 600 ⁴ | Two | # 2 AWG to 600 MCM |
| 800,1000,1200 ⁴ | Four | # 1/0 AWG to 600 MCM |
| 1600-2000 ⁴ | Six | # 1/0 AWG to 600 MCM |
| 2600, 3000 ⁴ | Ten | # 2 AWG to 600 MCM |
| 4000 ⁴ | Twelve | # 2 AWG to 600 MCM |

3. 200 and 230 amp rating for copper conductors only for transfer switch configurations only.

4. All main terminals are rear connected. A front connected version is available in 600 and 1200 amp ratings only with top cable entry only. See pages 25-27 for dimensional data and additional information.

5. Type 304 stainless steel standard. Specify 316 ST. Steel for installations subject to salt water and corrosive environments

ASCO® 7000 SERIES Designed to Fit Anywhere*

2-Position Transfer Switching 7A TS, 7N TS (Non-Bypass)

| Switch Rating Amps | Poles | Width inches (mm) | Height inches (mm) | Depth inches (mm) |
|---|------------------------------|-------------------|--------------------|-------------------|
| Enclosed UL Type 1² | | | | |
| 30, 70, 100, 125, 150, 200, 230 | 2, 3 or 3 with neutral A/B/C | 18 (457) | 48 (1219) | 13 (330) |
| 260, 400 | 2, 3 or 3 with neutral A/B/C | 24 (610) | 56 (1422) | 14 (356) |
| 600 | 2, 3 or 3 with neutral A/B/C | 24 (610) | 63 (1600) | 17 (432) |
| 800, 1000 | 2, 3 or 3 with neutral A/B/C | 34 (864) | 72 (1829) | 20 (508) |
| 1200 | 2, 3 or 3 with neutral A/B/C | 38 (965) | 87 (2210) | 23 (584) |
| 1600, 2000 ¹ | 2, 3 or 3 with neutral A/B/C | 38 (965) | 91 (2311) | 48 (1219) |
| 1600, 2000 ³ (front connected) | 2, 3 or 3 with neutral A/B/C | 38 (965) | 87 (2210) | 23 (584) |
| 2600, 3000 ¹ | 2, 3 or 3 with neutral A/B/C | 38 (965) | 91 (2311) | 60 (1524) |
| 4000 ¹ | 2, 3 or 3 with neutral A/C | 60 (1524) | 91 (2311) | 72 (1829) |
| Open Configuration | | | | |
| 30, 70, 100, 125, 150, 200, 230 | 2, 3 or 3 with neutral B/C | 10-1/4 (260) | 10-1/4 (260) | 5-1/2 (140) |
| 260, 400 | 2, 3 or 3 with neutral B/C | 18-1/2 (470) | 25 (635) | 8 (203) |
| 600 | 2, 3 or 3 with neutral B/C | 19 (483) | 30 (762) | 9-7/8 (251) |
| 800, 1000, 1200 | 2, 3 or 3 with neutral B/C | 27 (686) | 31 (787) | 12-7/8 (327) |
| 1600, 2000 | 2, 3 or 3 with neutral B/C | 33-1/4 (845) | 28 (711) | 26-1/4 (667) |
| 2600, 3000 | 2, 3 or 3 with neutral B/C | 33-1/4 (845) | 28 (711) | 30-3/4 (781) |
| 4000 | 2, 3 or 3 with neutral C | 60 (1524) | 70 (1778) | 53 (1272) |

Notes:

1. Enclosures are free-standing with removable top, sides, and back.
2. Consult ASCO for dimensions on enclosures other than UL type 1.
3. Order accessory 40MY for 1600A and 40NY for 2000A F/C design.

* All dimensions and weights shown are approximate and should not be used for construction purposes. Certified dimensions can be furnished upon request.

Shipping Weights

2-Position Transfer Switching 7A TS, 7N TS

| Switch Rating Amps | Poles | Enclosed* lb (kg) | Open* lb (kg) |
|--------------------|------------|----------------------|------------------|
| 30, 70, 100, 125 | 2 | 67 (31) | 15 (7) |
| 30, 70, 100, 125 | 3 | 70 (32) | 18 (8) |
| 30, 70, 100, 125 | 3 with B/C | 73 (33) | 21 (10) |
| 150, 200, 230 | 2 | 69 (32) | 17 (8) |
| 150, 200, 230 | 3 | 72 (33) | 20 (9) |
| 150, 200, 230 | 3 with B/C | 75 (34) | 23 (11) |
| 260, 400 | 2 | 216 (98) | 82 (37) |
| 260, 400 | 3 | 223 (101) | 89 (40) |
| 260, 400 | 3 with B/C | 230 (105) | 102 (46) |
| 600 | 2 | 316 (143) | 88 (40) |
| 600 | 3 | 324 (147) | 96 (44) |
| 600 | 3 with B/C | 332 (151) | 104 (47) |
| 800, 1000 | 2 | 400 (182) | 150 (68) |
| 800, 1000 | 3 | 420 (192) | 170 (78) |
| 800, 1000 | 3 with B/C | 446 (203) | 196 (90) |
| 1200 | 2 | 685 (312) | 150 (68) |
| 1200 | 3 | 705 (321) | 170 (78) |
| 1200 | 3 with B/C | 731 (333) | 196 (90) |
| 1600, 2000 | 2 | 1110 (503) | 370 (167) |
| 1600, 2000 | 3 | 1160 (525) | 420 (190) |
| 1600, 2000 | 3 with B/C | 1210 (548) | 470 (213) |
| 2600, 3000 | 2 | 1365 (620) | 405 (184) |
| 2600, 3000 | 3 | 1430 (649) | 470 (213) |
| 2600, 3000 | 3 with B/C | 1495 (679) | 535 (243) |
| 4000 | 2 | 1969 (893) | 1258 (571) |
| 4000 | 3 | 2149 (975) | 1451 (658) |
| 4000 | 3 with B/C | 2328 (1056) | 1623 (736) |

* All dimensions and weights shown are approximate and should not be used for construction purposes. Certified dimensions can be furnished upon request.

ASCO® 7000 SERIES Designed to Fit Anywhere*

Closed Transition and Delayed Transition Transfer Switching 7A DTS, 7A CTS, 7N DTS, 7N CTS

| Switch Rating Amps | Poles | Width inches (mm) | Height inches (mm) | Depth inches (mm) |
|---|----------------------------|-------------------|--------------------|-------------------|
| Enclosed UL Type 1² | | | | |
| 150, 260, 400 | 2, 3 or 3 with neutral A/B | 24 (610) | 56 (1422) | 14 (356) |
| 600 | 2, 3 or 3 with neutral A/B | 24(610) | 63 (1600) | 17(432) |
| 800, 1000 | 2, 3 or 3 with neutral A/B | 34 (864) | 72 (1829) | 20 (508) |
| 1200 | 2, 3 or 3 with neutral A/B | 38 (965) | 87 (2210) | 23 (584) |
| 1600, 2000 ¹ | 2, 3 or 3 with neutral A/B | 38 (965) | 91 (2311) | 48 (1219) |
| 1600, 2000 ³ (front connected) | 2, 3 or 3 with neutral A/B | 38 (965) | 87 (2210) | 23 (584) |
| 3000 ¹ | 2, 3 or 3 with neutral A/B | 38 (965) | 91 (2311) | 60 (1524) |
| 4000 ¹ | 2, 3 or 3 with neutral A/C | 60 (1524) | 91 (2311) | 72 (1829) |
| Open Configuration | | | | |
| 150, 260, 400 | 2, 3 or 3 with neutral B | 18-1/2 (470) | 25 (635) | 8 (203) |
| 600 | 2, 3 or 3 with neutral B | 19 (483) | 30 (762) | 9-7/8 (251) |
| 800, 1000, 1200 | 2, 3 or 3 with neutral B | 27 (686) | 31 (787) | 12-7/8 (327) |
| 1600, 2000 | 2, 3 or 3 with neutral B | 33-1/4 (845) | 28 (711) | 26-1/4 (667) |
| 2600, 3000 | 2, 3 or 3 with neutral B | 33-1/4 (845) | 28 (711) | 30-3/4 (781) |
| 4000 | 2, 3 or 3 with neutral C | 60 (1524) | 70 (1778) | 53 (1272) |

Notes:

1. Enclosures are free-standing with removable top, sides, and back.
2. Consult ASCO for dimensions on enclosures other than UL type 1.
3. Order accessory 40MY for 1600A and 40NY for 2000A front connected design.

*All dimensions and weights shown are approximate and should not be used for construction purposes. Certified dimensions can be furnished upon request.

Shipping Weights

Closed Transition and Delayed Transition Transfer Switching 7A DTS, 7A CTS, 7N DTS, 7N CTS

| Switch Rating Amps | Poles | Enclosed* lb (kg) | Open* lb (kg) |
|--------------------|------------|-------------------|---------------|
| 150, 260, 400 | 2 | 235 (107) | 101 (46) |
| 150, 260, 400 | 3 | 242 (110) | 108 (49) |
| 150, 260, 400 | 3 with B | 250 (113) | 115 (52) |
| 600 | 2 | 335 (152) | 107 (48) |
| 600 | 3 | 343 (156) | 115 (52) |
| 600 | 3 with B | 352 (159) | 124(56) |
| 800, 1000 | 2 | 420 (192) | 175 (80) |
| 800, 1000 | 3 | 450 (205) | 205 (94) |
| 800, 1000 | 3 with B | 480 (219) | 235 (108) |
| 1200 | 2 | 710 (324) | 175 (80) |
| 1200 | 3 | 740 (337) | 205 (94) |
| 1200 | 3 with B | 770 (351) | 235 (108) |
| 1600, 2000 | 2 | 1300 (590) | 505 (229) |
| 1600, 2000 | 3 | 1350 (612) | 555 (252) |
| 1600, 2000 | 3 with B | 1400 (635) | 605 (274) |
| 2600, 3000 | 2 | 1555 (706) | 540 (245) |
| 2600, 3000 | 3 | 1620 (735) | 660 (300) |
| 2600, 3000 | 3 with B | 1685 (765) | 725 (329) |
| 4000 | 2 | 1969 (893) | 1258 (571) |
| 4000 | 3 | 2149 (975) | 1451 (658) |
| 4000 | 3 with B/C | 2328 (1056) | 1623 (736) |

Notes:

1. Open weights include transfer switch and control panel. 1200-4000 amp enclosures require ventilation openings, refer to drawings for details. Export shipments may require a wooden box, contact ASCO for weights and dimensions.

*All dimensions and weights shown are approximate and should not be used for construction purposes. Certified dimensions can be furnished upon request.

ASCO® 7000 SERIES Designed to Fit Anywhere*

Automatic Transfer Bypass-Isolation Switching with Transfer Switch Engaged 7A TB, 7N TB

| Switch Rating amps | Power Connection Configuration | Poles | Width inches (mm) | Height inches (mm) | Depth inches (mm) |
|--|-----------------------------------|------------------------------|---------------------------|----------------------------|---------------------------|
| Enclosed UL Type 1 | | | | | |
| 150, 200, 230, 260, 400 ^{1,600} | Front Connected | 2, 3 or 3 with neutral A/B/C | 34 (864) | 85 (2159) | 28 (711) |
| 800 ^{1,3} | Front Connected | 2, 3 or 3 with neutral A/B/C | 38 (965) | 91 (2311) | 32 (813) |
| 1000, 1200 | Front Connected | 2, 3 or 3 with neutral A/B/C | 38 (965) | 91 (2311) | 34 (864) |
| 800, 1000, 1200 ^{1,2} | Side/Rear Connected | 2, 3 or 3 with neutral A/B/C | 38 (965) | 91 (2311) | 48 (1219) |
| 1600, 2000 ^{1,2} | Side/Rear Connected | 2, 3 or 3 with neutral A/B/C | 38 (965) | 91 (2311) | 60 (1524) |
| 2600, 3000 ^{1,2} | Side/Rear Connected | 3 or 3 with neutral A/B/C | 38 (965) | 91 (2311) | 72 (1829) |
| 4000 ^{1,2} | Rear Connected | 3 or 3 with neutral A/C | 60(1524) | 91 (2311) | 96 (2438) |
| Open Configuration | | | | | |
| 150, 200, 230, 260, 400 ¹ | Front Connected | 2, 3 or 3 with neutral B/C | 19-3/4 (500) ⁴ | 61-1/2 (1553) ⁴ | 22-1/4 (565) ⁴ |
| 600, 800, 1000, 1200 ^{1,2} | Rear Connected | 2, 3 or 3 with neutral B/C | 38 (965) | 72 (1829) | 38 (965) |
| 1600, 2000, 2600, 3000 ^{1,2} | Rear Connected | 2, 3 or 3 with neutral B/C | 38 (965) | 72 (1829) | 38 (965) |
| 4000 ^{1,2} | Rear Connected | 3 or 3 with neutral A/C | 60(1524) | 91 (2311) | 96 (2438) |

- Notes:
1. Handles extend 6-1/4 inches (159mm).
 2. Recommended clearance to enclosure: 3 feet (914mm) from rear, 4 feet (1219mm) from front (25 inches required for transfer switch drawout). Side or rear access required.
 3. Specify optional accessory 40JY for 800 Amp front, 40KY for 1000 Amp, and 40LY for 1200 Amp - connected arrangement. All service and load cables limited to top entry only.
 4. Contact ASCO for details.

*All dimensions and weights shown are approximate and should not be used for construction purposes.
Certified dimensions can be furnished upon request.

Shipping Weights

Automatic Transfer Bypass-Isolation Switching with Transfer Switch Engaged 7A TB, 7N TB

| Switch Rating amps | Poles | Enclosed * lb (kg) | Open * lb (kg) |
|------------------------------|------------|-----------------------|-------------------|
| 150, 200, 230, 260, 400, 600 | 2 | 990 (450) | Contact ASCO |
| 150, 200, 230, 260, 400, 600 | 3 | 1050 (477) | Contact ASCO |
| 150, 200, 230, 260, 400, 600 | 3 with B/C | 1110 (505) | Contact ASCO |
| 800, 1000, 1200 | 2 | 1510 (685) | 920 (417) |
| 800, 1000, 1200 | 3 | 1580 (717) | 990 (449) |
| 800, 1000, 1200 | 3 with B/C | 1650 (748) | 1060 (481) |
| 1600, 2000 | 2 | 2180 (989) | 1300 (589) |
| 1600, 2000 | 3 | 2360 (1070) | 1550 (702) |
| 1600, 2000 | 3 with B/C | 2540 (1152) | 1800 (815) |
| 2600, 3000 | 3 | 2730 (1240) | 1690 (768) |
| 2600, 3000 | 3 with B/C | 3360 (1525) | 1980 (899) |
| 4000 | 3 | 6300 (2858) | — |
| 4000 | 3 with B/C | 6900 (3130) | — |

- Notes:
1. Open weights include transfer switch, bypass-isolation switch and controller.
 - 1600-4000 amp enclosures require ventilation openings, refer to drawings for details.
 - Export shipments may require a wooden box, contact ASCO for weights and dimensions.
- *All dimensions and weights shown are approximate and should not be used for construction purposes.
Certified dimensions can be furnished upon request.

Automatic Transfer Bypass-Isolation in Closed Transition and Delayed Transition Switching. 7A DTB⁶, 7A CTB, 7N DTB⁶, 7N CTB

| Switch Rating amps | Power Connection Configuration | Poles | Width inches (mm) | Height inches (mm) | Depth inches (mm) |
|--|-----------------------------------|------------------------------|---------------------------|----------------------------|---------------------------|
| Enclosed UL Type 1 | | | | | |
| 150, 200, 230, 260, 400 ^{1,600} | Front Connected | 2, 3 or 3 with neutral A/B/C | 34 (864) | 85 (2159) | 28 (711) |
| 800 ^{1,3} | Front Connected | 2, 3 or 3 with neutral A/B/C | 38 (965) | 91 (2311) | 32 (813) |
| 1000, 1200 | Front Connected | 2, 3 or 3 with neutral A/B/C | 38 (965) | 91 (2311) | 34 (864) |
| 800, 1000, 1200 ^{1,2} | Side/Rear Connected | 2, 3 or 3 with neutral A/B/C | 38 (965) | 91 (2311) | 48 (1219) |
| 1600, 2000 ^{1,2} | Side/Rear Connected | 2, 3 or 3 with neutral A/B/C | 38 (965) | 91 (2311) | 60 (1524) |
| 2600, 3000 ^{1,2} | Side/Rear Connected | 3 or 3 with neutral A/B/C | 38 (965) | 91 (2311) | 72 (1829) |
| 4000 ^{1,2} | Rear Connected | 3 or 3 with neutral A/C | 60(1524) | 91 (2311) | 96 (2438) |
| Open Configuration | | | | | |
| 150, 200, 230, 260, 400 ¹ | Front Connected | 2, 3 or 3 with neutral B/C | 19-3/4 (500) ⁴ | 61-1/2 (1553) ⁴ | 22-1/4 (565) ⁴ |
| 600, 800, 1000, 1200 ^{1,2} | Rear Connected | 2, 3 or 3 with neutral B/C | 38 (965) | 72 (1829) | 38 (965) |
| 1600, 2000, 2600, 3000 ^{1,2} | Rear Connected | 2, 3 or 3 with neutral B/C | 38 (965) | 72 (1829) | 38 (965) |
| 4000 ^{1,2} | Rear Connected | 3 or 3 with neutral A/C | 60(1524) | 91 (2311) | 96 (2438) |

Notes: 1. Handles extend 6-1/4 inches (159mm).

2. Recommended clearance to enclosure: 3 feet (914mm) from rear, 4 feet (1219mm) from front (25 inches required for transfer switch drawout). Side or rear access required.

3. Specify optional accessory 40JY for 800 Amp front, 40KY for 1000 Amp, and 40LY for 1200 Amp - connected arrangement. All service and load cables limited to top entry only.

4. Contact ASCO for details.

*All dimensions and weights shown are approximate and should not be used for construction purposes.

Certified dimensions can be furnished upon request.

Shipping Weights

Automatic Transfer Bypass-Isolation in Closed Transition and Delayed Transition Switching. 7A DTB, 7A CTB, 7N DTB, 7N CTB

| Switch Rating amps | Poles | Enclosed* lb (kg) | Open* lb (kg) |
|------------------------------|------------|----------------------|------------------|
| 150, 200, 230, 260, 400, 600 | 2 | 990 (450) | Contact ASCO |
| 150, 200, 230, 260, 400, 600 | 3 | 1050 (477) | Contact ASCO |
| 150, 200, 230, 260, 400, 600 | 3 with A/B | 1110 (505) | Contact ASCO |
| 800, 1000, 1200 | 2 | 1560 (708) | 970 (440) |
| 800, 1000, 1200 | 3 | 1630 (739) | 1040 (472) |
| 800, 1000, 1200 | 3 with A/B | 1700(771) | 1110(503) |
| 1600, 2000 | 2 | 2315 (1050) | 1435 (651) |
| 1600, 2000 | 3 | 2495 (1132) | 1685 (764) |
| 1600, 2000 | 3 with A/B | 2675 (1213) | 1935 (878) |
| 2600, 3000 | 3 | 2730 (1240) | 1690 (768) |
| 2600, 3000 | 3 with A/B | 3360 (1525) | 1980 (899) |
| 4000 | 3 | 6300 (2858) | — |
| 4000 | 3 with C | 6900 (3130) | — |

Notes: 1. Open weights include transfer switch, bypass-isolation switch and controller.

1600-4000 amp enclosures require ventilation openings, refer to drawings for details.

Export shipments may require a wooden box, contact ASCO for weights and dimensions.

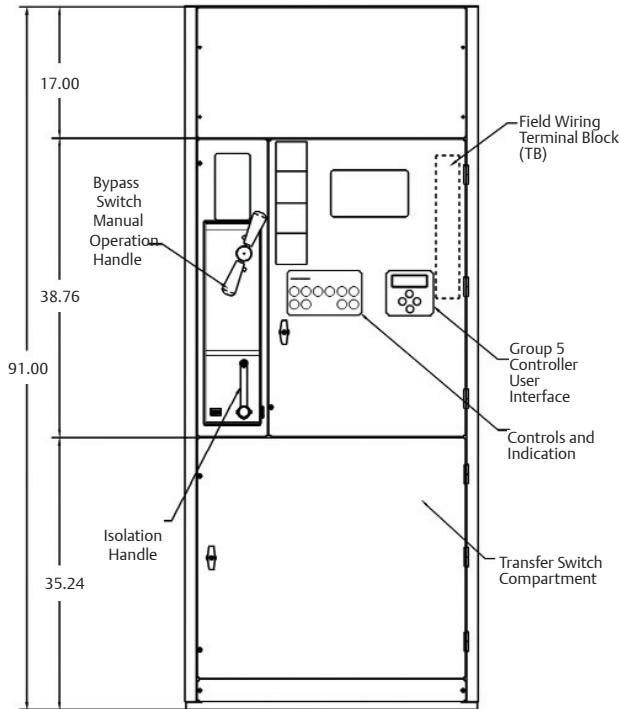
*All dimensions and weights shown are approximate and should not be used for construction purposes.

Certified dimensions can be furnished upon request.

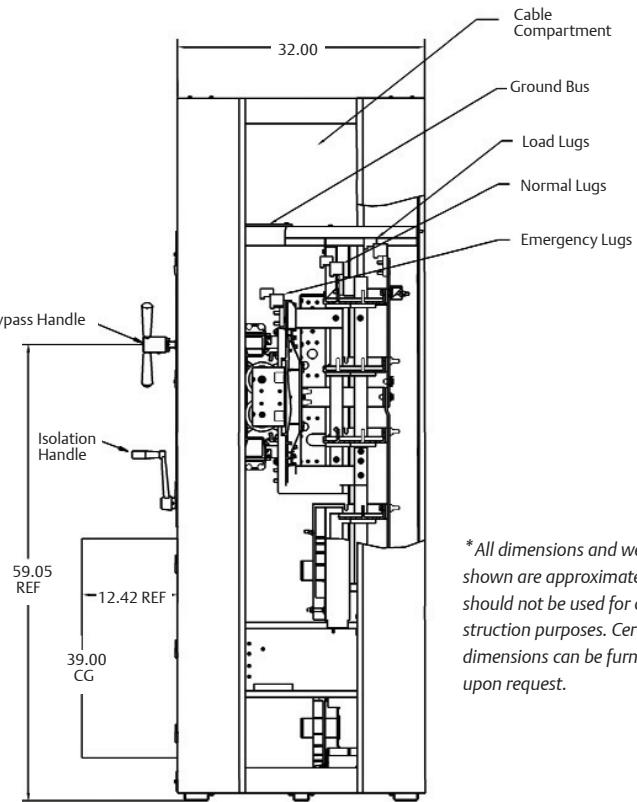
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Optional Front Connected Design Saves Valuable Space

800 Amp Optional Front Connected Design



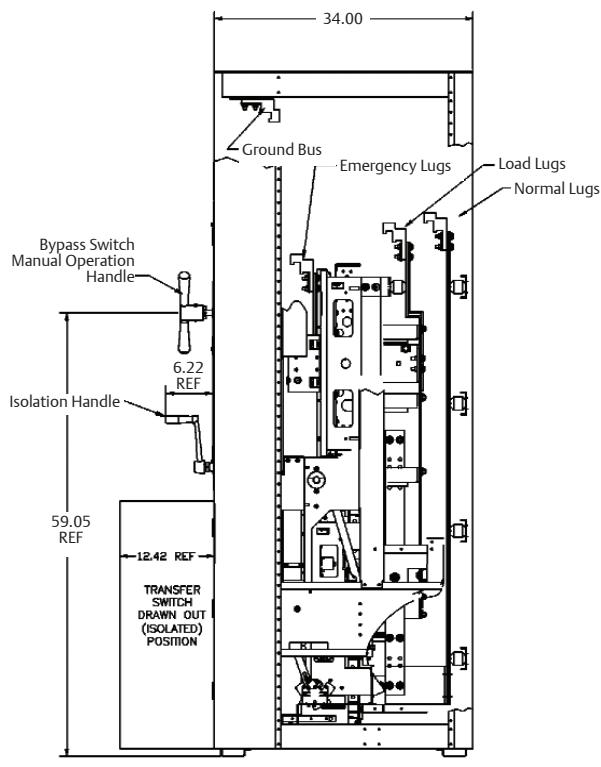
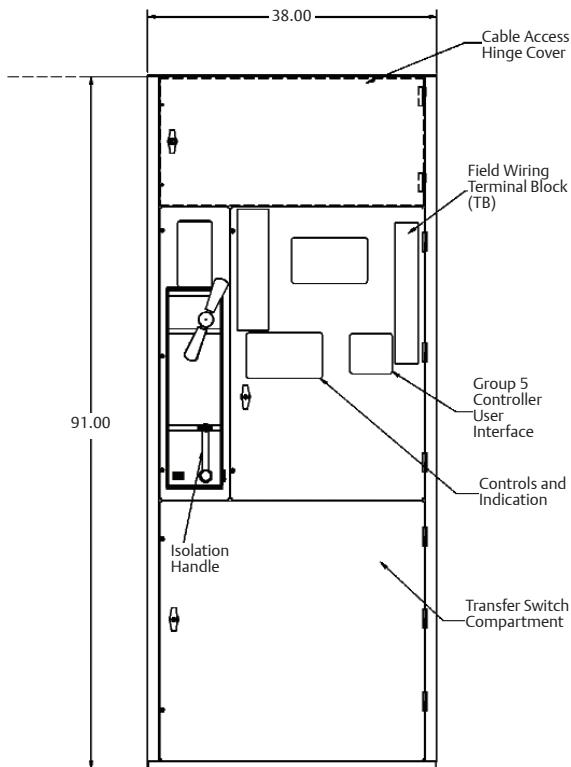
Front Views (Covers Installed)



*All dimensions and weights shown are approximate and should not be used for construction purposes. Certified dimensions can be furnished upon request.

Right Side Views (Covers Removed)

1000-1200 Amp Optional Front Connected Design



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